CLAIMS

1. A vibration damping device comprising a laminated plate (20) in which at least an interior part thereof is fastened to a base material (11) that emits noise, characterized in that the interior part is a part (G) other than a part that forms a loop of a vibration mode when the base material (11) is caused to vibrate in a vibration mode at a specified frequency.

2. A vibration damping device comprising a laminated plate (20) in which at least an interior part thereof is fastened to a base material (11) that emits noise, characterized in that the interior part is a part (G) other than a part that forms a loop with respect to a plurality of vibration modes when the base material is caused to vibrate in respective vibration modes at a plurality of frequencies.

3. A vibration damping device comprising a laminated plate (20) in which at least an interior part thereof is fastened to a side plate (11) of a bucket (10) of a construction machine, characterized in that the interior part is within a region G comprising i) a part D consisting of a center point d of a line segment BC that connects a point B where a line segment CA that connects a circular arc center C of the side plate (11) which has a substantially circular arc shape in at least a portion of one side and a point A where there is a transition from the substantially circular arc shape to another shape on a side of attachment of the bucket (10) to the construction machine intersects with the laminated plate (20), and the circular arc center C, and an area in the vicinity of the center point d, ii) a part F consisting of a center point f of the line segment CA and an area in the vicinity of the center point f, and iii) a region between the part D and the part F.

4. A bucket for a construction machine comprising:

a side plate (11);

a bottom plate (12), at least a portion of which is connected to the side plate (11); and

a laminated plate (20) which is attached to the side plate (11);

characterized in that in cases where a ratio Wp/Hs of a width Wp of the bottom plate (12) to a height Hs of the side plate (11) is 1.47 or greater, at least a part (16) of the portion where the side plate (11) and the bottom plate (12) are connected is reinforced.

5. A bucket for a construction machine comprising:

a side plate (11);

a bottom plate (12), at least a portion of which is connected to the side plate (11); and

a laminated plate (20) which is attached to the side plate (11);

characterized in that in cases where a ratio Wp/Hs of a width Wp of the bottom plate (12) to a height Hs of the side plate (11) is 1.47 or greater, a part (K), which forms a loop of a vibration mode, of the portion where the side plate (11) and the bottom plate (12) are connected is reinforced

6. A bucket for a construction machine comprising:

a side plate (11);

a bottom plate (12), at least a portion of which is connected to the side plate (11); and

a laminated plate (20) which is attached to the side plate (11);

characterized in that in cases where a ratio Wp/Hs of a width Wp of the bottom plate (12) to a height Hs of the side plate (11) is 1.47 or greater, a connecting member (15) that connects the side plate (11) and the bottom plate (12) is provided so that a ratio Wp'/Hs of a substantial width Wp' of the bottom plate (12) to the height Hs is less than 1.47.

7. A bucket for a construction machine comprising:

a side plate (11);

a bottom plate (12), at least a portion of which is connected to the side plate (11); and

a laminated plate (20) which is attached to an outside of the side plate (11);

characterized in that at least a part (16) of the portion where the side plate (11) and the bottom plate (12) are connected on insides of the side plate (11) and the bottom plate (12) is reinforced.

8. The vibration damping device according to claim 1 or claim 2, characterized in that the base material (11) constitutes a side plate (211) of a bucket (200) of a construction machine, and the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and in cases where a ratio Wp/Hs of a width Wp of the bottom plate (212) to a height of the side plate (211) is 1.47 or greater, at least a part (K) of the portion where the side plate (211) and the bottom plate (212) are connected is reinforced.

9. The vibration damping device according to claim 3, characterized in that the device comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and in cases where a ratio Wp/Hs of a width Wp of the bottom plate (212) to a height of the side plate (211) is 1.47 or greater, at least a part (K) of the portion where the side plates (211) and the bottom plate (212) are connected is reinforced.

10. The vibration damping device according to claim 1 or claim 2, characterized in that the base material (11) constitutes a side plate (211) of a bucket (200) of a construction machine, and the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and in cases where a ratio Wp/Hs of a width Wp of the bottom plate (212) to a height of the side plate (211) is 1.47 or greater, a part (K), which forms a loop of the vibration mode, of the portion where the side plate (211) and the bottom plate (212) are connected is reinforced.

11. The vibration damping device according to claim 3, characterized in that the device comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and in cases where a ratio Wp/Hs of a width Wp of the bottom plate (212) to a height of the side plate (211) is 1.47 or greater, a part (K), which forms a loop of the vibration mode, of the portion where the side plate (211) and the bottom plate (212) are connected is reinforced.

12. The vibration damping device according to claim 1 or claim 2, characterized in that the base material (11) constitutes a side plates (211) of a bucket (200) of a construction machine, and the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and a connecting member (215) that connects the side plate (211) and the bottom plate (212) so that a ratio Wp'/Hs of a substantial width Wp' of the bottom plate (212) to a height Hs of the side plate (211) is less than 1.47 in cases where a ratio Wp/Hs of a width Wp of the bottom plate (212) to the height Hs is 1.47 or greater.

13. The vibration damping device according to claim 3, characterized in that the device comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and a connecting member (215) which connects the side plate (211) and the bottom plate (212) so that a ratio Wp'/Hs of a substantial width Wp' of the bottom plate (212) to a height Hs of the side plate (211) is less than 1.47 in cases where a ratio Wp/Hs of a width Wp of the bottom plate (212) to the height Hs is 1.47 or greater.

14. The vibration damping device according to claim 1 or claim 2, characterized in that the base material (11) constitutes a side plates (211) of a bucket (200) of a construction machine, the laminated plate (220) is attached to an outside of the side plate (211), the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and at least a part (K) of the portion where the side plate

(211) and the bottom plate (212) are connected on insides of the side plate (211) and the bottom plate (212) is reinforced.

15. The vibration damping device according to claim 3, characterized in that the laminated plate (220) is attached to an outside of the side plate (211), the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and at least a part (K) of the portion where the side plate (211) and the bottom plate (212) are connected on insides of the side plate (211) and the bottom plate (212) is reinforced.

16. A vibration damping device comprising a laminated plate (910) formed by laminating a specified number of inner plates (912) and an outer plate (911) that is disposed on an outside of the specified number of the inner plates (912), characterized in that the specified number of inner plates (912) are tightly sealed by the outer plate (911) and a machine (901) that is an object of vibration damping.

17. The vibration damping device according to claim 1 or claim 2, characterized in that the laminated plate (910) is formed by laminating a specified number of inner plates (912) and an outer plate (911) that is disposed on an outside of the specified number of the inner plates (912), and the specified number of the inner plates (912) are tightly sealed by the outer plate (911) and a machine (901) that is an object of vibration damping.

18. The vibration damping device according to claim 17, characterized in that the machine (901) that is the object of vibration damping constitutes the side plate (211) of a bucket (300) of a construction machine, the laminated plate (910) is attached to the outside of the side plate (211), the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and at least a part (K) of the portion where the side plate (211) and the bottom plate (212) are connected on insides of the side plate (211) and the bottom plate (212) is reinforced.

19. The vibration damping device according to claim 3, characterized in that the laminated plate (910) is formed by laminating a specified number of inner plates (912) and an outer plate (911) that is disposed on an outside of the specified number of inner plates (912), and the specified number of the inner plates (912) are tightly sealed by the outer plate (911) and the side plate (211).

20. The vibration damping device according to claim 19, characterized in that the laminated plate (910) is attached to an outside of the side plate (211), the device further comprises a bottom plate (212), at least a portion of which is connected to the side plate (211), and at least a part (K) of the portion where the side plate (211) and the bottom plate (212) are connected on insides of the side plate (211) and the bottom plate (212) is reinforced.

21. The bucket for a construction machine according to claim 7, characterized in that the laminated plate (910) is formed by laminating a specified number of inner plates (912) and an outer plate (911) that is disposed on an outside of the specified number of the inner plates (912), and the specified number of the inner plates (912) are tightly sealed by the outer plate (911) and the side plate (211).

22. The vibration damping device according to claim 16, characterized in that the laminated plate (110, 130) is formed by laminating a specified number of inner plates (111, 131), and an outer plate (112, 132) which is disposed on the outside of the specified number of inner plates (111, 131) and which has a shape that differs from those of the inner plates (111, 131), the inner plates (111, 131) are caused to contact with members (103, 128) of the machine that is the object of vibration damping, and the laminated plate (110, 130) is coupled to the members (103, 128) of the machine by performing continuous welding on peripheral edges of the outer plate (112, 132).

23. The vibration damping device according to claim 16, characterized in that intermittent welding consisting of welding in a plurality of locations is further performed on

peripheral edges of the inner plates (111, 131) when the laminated plate (110, 130) is coupled to members (103, 128) of the machine.

24. The vibration damping device according to claim 16 or claim 23, characterized in that the member (103) of the machine has a contact member (108) that is capable of contacting end portions of the laminated plate (110), the inner plate (111) has a contact part (111b) that protrudes from a peripheral edge of the outer plate (112) and contacts with the contact member (108), and continuous welding that covers the contact part (111b) of the inner plate (111) is performed between the peripheral edge of the outer plate (112) and the contact member (108).

25. The vibration damping device according to claim 16 or claim 23, characterized in that a plurality of protruding parts (131a) that match a peripheral edge shape of the outer plate (132) are disposed on the peripheral edge of the inner plate (131), and the plurality of protruding parts (131a) of the inner plate (131) are intermittently welded by performing continuous welding on the peripheral edge of the outer plate (132).

26. The vibration damping device according to claim 24, characterized in that a length of the contact part (111b) of the inner plate (111) is 100 to 280 mm.

27. The vibration damping device according to claim 25, characterized in that the plurality of protruding parts (131a) of the inner plate (131) are disposed at intervals of 100 to 280 mm.

28. A vibration damping device comprising:

a laminated plate (910) which is formed by laminating a specified number of inner plates (912), and an outer plate (911) which is disposed on an outside of the specified number of the inner plates (912), and which has a shape that differs from those of the specified number of the inner plates (912); and

members (914, 918) which connect the outer plate (911) and a machine (901) that is an object of vibration damping;

characterized in that the outer plate (911) and the machine (901) that is the object of vibration damping are coupled via the connecting members (914, 918).